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Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

ASSESSMENT OF MYOCARDIAL VIABILITY BASED ON DUAL-SOURCE COMPUTED TOMOGRAPHY IN PATIENTS WITH CHRONIC MYOCARDIAL INFARCTION: COMPARISON WITH MAGNETIC RESONANCE IMAGING

Poster Contributions
Poster Hall B1
Sunday, March 15, 2015, 3:45 p.m.-4:30 p.m.

Session Title: Non Invasive Imaging: CT/Multimodality, Angiography, and Non-CT Angiography
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Background: The purpose of study was to evaluate the diagnostic performance of dual-energy computed tomography (DECT) for the assessment of myocardial viability using magnetic resonance imaging (MRI) as a reference standard in patients with chronic myocardial infarction (MI).

Methods and Results: Thirty-two consecutive patients (26 men [81.3%]; mean age, 65±10 years) were prospectively enrolled between July 2014 and August 2014, who had history of MI and underwent late iodine enhancement DECT (320-detector CT , aquilion vision®: Toshiba Medical System Corporatin, Otawara, Japan) and MRI with late enhancement within 6 month interval. Protocol of DECT was as follow: 1.contrast amount : 1.5ml/kg, 2. Early phase image acquisition, 3. Delayed enhancement at 5minutes. Images were reconstructed as 80 kilovolt (peak)(kV[p]), weight-average (WA; linear blending) images from low- an high-kV[p] peak data using 0.6 weighting factors, and additional color-coded iodine distribution maps were used for analysis. The mean radiation dose was 5.3mSV. Figure was representative images with concordance between CT and MRI. Among 544 myocardial segments and 96 vascular territories, 145 segments (26.7%) and 46 vessels (47.9%) showed LGE on MRI. In per-segment analysis using low kV[p] and WA of 0.6 images, there was same results for the identification of Chronic MI by DECT compared with MRI (sensitivity: 76.90%, specificity: 89.50%, positive and negative predictive values: 72.90% and 91.40%). In per-vessel analysis, same measures also showed similar results (sensitivity: 81.8%, specificity: 90%, positive and negative predictive values: 90% and 81.8%) in low kV[p] and WA of 0.6 linear blending images. However, iodine maps were less reliable for detecting CMI because of low sensitivity and high false-negative findings (34% sensitivity, 92% specificity, diagnostic accuracy: 75%).

Conclusion: Late iodine enhancement DECT using low kilovoltage (80 kV[p]) and WA of 0.6 linear blending images well correlate with LGE-MRI for detecting Chronic MI, whereas iodine distribution analysis provides low diagnostic accuracy.